

REMARKS

This Amendment is in response to the Office Action dated September 11, 2008. New claims 5-7 are added and claims 1-7 are now pending in the present application. No new matter is introduced. Support for the new claims 5-7 can be found in the specification as originally filed at least at page 6, paragraph [0020], page 11, paragraph [0027] and page 17, paragraphs [0051] and [0052].

Claim Rejections under 35 U.S.C. § 103

A. Rejection of Claim 1 over U.S. Publication No. 2002/0075632, to Nakano et al. over Japanese Patent No. 08111346, to Takada et al.

Claim 1 is rejected as being obvious over U.S. Publication No. 2002/0075632, to Nakano et al. (“Nakano”) over Japanese Patent No. 08111346, to Takada et al. (“Takada”). It is respectfully submitted that Nakano and Takada taken alone or in combination do not teach or suggest the claimed combination in claim 1.

Claim 1 recites, *inter alia* “[a] dielectric paste adapted for forming a spacer layer and containing a butyral system resin as a binder and at least one solvent selected from a group consisting of dihydroterpinyl oxyethanol, terpinyl oxyethanol, d-dihydrocarveol, l-citronellol, l-perillylalcohol and acetoxymethoxyethoxycyclohexanol acetate as a solvent.” It is asserted in the Office Action that since Nakano teaches use of butyral resin in a dielectric paste and Takada teaches use of citronellol, it would have been obvious to provide a paste that Nakano teaches where the solvent of the binder is citronellol “as Takada teaches citronellol is appropriate solvent for making internal electrodes in multilayer capacitors.” Office Action, p. 2. The following discussion demonstrates that Nakano and Takada taken alone or in combination do not teach or suggest the features of claim 1.

In Nakano, “the dielectric layers 2 and internal electrode layers 3 are alternatively stacked.” Nakano, p. 2, ¶ [0031]. Therefore, since a multi-layered ceramic capacitor as shown in Figure 1 of Nakano includes dielectric layers and internal electrode layers 3 alternately stacked and it includes no spacer layer, the dielectric paste of Nakano is adapted for forming a

dielectric ceramic green sheet; not a spacer layer to be disposed between a dielectric ceramic green sheet and an inner electrode layer. Moreover, even if the green sheets 2 in Nakano were analogized to the dielectric paste for spacers as claimed, there is no teaching in Nakano to use a butyral system resin in a paste for a dielectric layer. The passage from Nakano cited in the Office Action in support of rejecting claim 1, namely, paragraph [0056], is describing constituents of the external electrode 4 because paragraph [0056] is under the subheading “[0045] External Electrode 4.” Nakano, ¶¶ [0045] and [0056]. Therefore, Nakano does not disclose use of a butyral system resin in a dielectric paste.

Even with respect to the conductive paste, Nakano discloses a paste that can use butyral resin as one example of a binder; however, Nakano fails to recognize the particular combination of butyral resin with any one of the solvents recited in claim 1. Nakano simply lists butyral resin as one example of a binder for a conductive paste, stating that “any of well-known ones can be used, for example, ethyl cellulose, acrylic resin, butyral resin, etc.” Nakano, ¶ [0060]; *see also* Nakano ¶ [0056]. Furthermore, the solvents listed in Nakano do not include any of the solvents recited in claim 1. *See* Nakano, ¶ [0060]. The Office Action states that Takada teaches the use of citronellol as a solvent.

However, Takada does not suggest or motivate using citronellol in a dielectric paste or to use this solvent together with a butyral system resin. The Takada paste is for the inner electrode, which does not include polyvinylbutyral. *See* Takada, ¶ [008]. Takada discloses that the dielectric green sheet contains polyvinylbutyral. This interpretation of Takada is consistent with the computer translation of Takada referred to in the Office Action. Takada, in paragraph [007] of the translation, states, “A dielectric green sheet consists of ... an organic binder of a polyvinyl butyral. A paste for internal electrodes consists ... of an organic binder which consists of resin, such as ethyl cellulose...” Furthermore, below is a non-certified translation of claims 1 and 2 of Takada, provided by Applicants’ Japanese Legal representative. Based on this translation, claim 1 of Takada recites, *inter alia*:

A paste for an inner electrode of a multilayered ceramic capacitor adapted for constituting a multilayered ceramic capacitor in cooperation with a dielectric green sheet

containing polybutyral as an organic binder, the paste containing at least one kind of solvent selected from geraniol, ..., citronellol, ... and limonene as an organic solvent for dissolving resin. Emphasis added.

Accordingly, the paste of Takada does not itself contain polybutyral, but rather, the polybutyral is contained in the green sheet. Furthermore, claim 2 of Takada as translated recites, *inter alia*, “[t]he paste in accordance with Claim 1, which contains ethyl cellulose as a resin” as also stated in paragraph [007] of the translation. Hence, the binder in the paste for an inner electrode in Takada is not polybutyral, but ethyl cellulose. As discussed in the specification of the present application, forming a spacer layer using a dielectric paste, as claimed, containing a butyral system resin as a binder and at least one of the solvents recited in claim 1, prevents generation of defects that can lead to pinholes and cracks in the ceramic green sheet even where the latter is very thin. *See* Specification, p. 6 ¶¶ [0015] and [0016], and p. 15 ¶¶ [0043] and [0044]. Therefore, Takada does not provide any information with respect to propriety of citronellol as a solvent for a butyral resin binder in a dielectric paste.

Applicants are the first to recognize that a dielectric paste for forming a spacer layer specifically containing a butyral system resin as a binder and at least one of the solvents recited in claim 1 prevents generation of defects in the ceramic green sheet. *See e.g.*, Specification, pp. 4-6. The only motivation for a paste binder that can be inferred from the combination of Nakano and Takada, if any, is ethyl cellulose because Takada teaches that the binder used in the conductive paste of that invention is ethyl cellulose and Nakano refers to ethyl cellulose as one example of a binder for a conductive paste. Even this inference can only be limited to a binder for a conductive paste, as use of a resin in Nakano and of citronellol in Takada are discussed in context of conductive pastes.

Additionally, there is no motivation to particularly combine the butyral resin of Nakano, which as discussed above is for an external electrode and not a spacer layer, with the citronellol solvent in Takada, which is for an internal electrode layer, not a dielectric paste as claimed. “Rejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to

support the legal conclusion of obviousness.” *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006) (cited by, *KSR Int’l Co.*, 127 S.Ct. 1727 at 1740-1741). “The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, not in applicant’s disclosure.” MPEP § 2143.

In the present case, neither Nakano nor Takada provide any reasonable expectation that generation of pinholes and cracks can be prevented if a butyral system resin is combined with at least one of the solvents in a dielectric spacer layer as recited in claim 1. Furthermore, Nakano and Takada do not provide any teaching or suggestion for the claimed combination, and there is no rationale provided in the Office Action for why one of ordinary skill in the art would otherwise be motivated to make the claimed combination. *See KSR Int’l Co. v. Teleflex Inc., et al.*, 127 S.Ct. 1727, 1740-1741 (2007) (Often, it will be necessary for a court to look to interrelated teachings of multiple patents; the effects of demands known to the design community or present in the market place; and the background knowledge possessed by a person having ordinary skill in the art, all in order to determine whether there was an apparent reason to combine the known elements in the fashion claimed by the patent at issue) (emphasis added).

It is noted that in a recent Office Action issued in a co-pending application serial number 10/580,749 on October 16, 2008 (“749 Office Action”), the Examiner agrees that the Takada paste does not include a butyral system resin and cites to U.S. Patent No. 6,563,690, to Kishi et al. (“Kishi”). Kishi is presently being disclosed in the present U.S. Application Serial No. 10/582,995 in an Information Disclosure Statement, and the comments below distinguish this reference and demonstrate that there is no motivation to combine its teachings with Takada.

B. Allowability of Claim 1 over U.S. Patent No. 6,563,690, to Kishi et al. and Takada

Enclosed herewith is an Information Disclosure Statement to disclose Kishi. Kishi generally discusses organic binders for preparation of a conductive paste in the background section. *See Kishi*, column 1, lines 50-54. Kishi lists three examples of organic binders including ethyl cellulose resin, unsaturated polyester resin or butyral resin, along with a list of two solvents, neither of which are among those recited in claim 1. Similar to Nakano, Kishi’s

disclosure in this regard is related to a conductive paste; not a dielectric paste adapted for forming a spacer layer as claimed.

Furthermore, there is no motivation to combine the teachings of Kishi and Takada. The teachings of cited references and what they convey to one of ordinary skill in the art must be considered at the time the invention was made. “The requirement ‘at the time the invention was made’ is to avoid impermissible hindsight.” MPEP 2141.01.III. In the present case, Takada and Kishi name citronellol and butyral resin in different contexts for different compositions and in passing, as examples among a number of solvents and organic binders, respectively. However, “Obviousness can be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so.” MPEP 2143.01.I (emphasis added).

Here, there is no teaching, suggestion or motivation to combine isolated portions of Takada and Kishi to arrive at the features in claim 1. Furthermore, the references do not provide any suggestion or teaching that such a combination would be desirable or that the particular combination claimed would result in alleviation of voids and other defects as elaborated in the specification and discussed above. Accordingly, one of ordinary skill in the art would have no apparent reason to pick and choose one specific resin from a list enumerated in Kishi in context of a conductive paste, and one specific solvent from a list enumerated in Takada in context of an internal electrode layer, not a dielectric paste, and combine them to arrive at a dielectric paste as that recited in claim 1 to obtain the benefits disclosed in the present specification.

Accordingly, claim 1, and claims 2-4, which are dependent therefrom, are allowable.

C. Rejection of Claims 2-4 over Nakano and Takada in view of Japanese Patent No. 09124771, to Kobayashi

Claims 2-4 are rejected as being obvious over Nakano and Takada in view of Japanese Patent No. 09124771, to Kobayashi (“Kobayashi”). Claims 2-4 are directed to specification particulars of the butyral system resin. As demonstrated above Nakano and Takada

fail to disclose a dielectric paste for forming a spacer layer containing a butyral system resin. Accordingly, Nakano, Takada and Kobayashi, even if combined, do not teach, suggest, or motivate the features of claim 1, from which claims 2-4 depend.

Furthermore, the mere fact that the references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination. MPEP § 2143.01 (emphasis added). As discussed above, it is also important to consider whether there was an apparent reason to combine the known elements in the fashion claimed by the patent at issue. *See KSR Int'l Co. v. Teleflex Inc., et al.*, 127 S.Ct. 1727, 1740-1741 (2007). In this case, Takada relates to a multi-layered ceramic electronic component while Kobayashi relates to an anisotropic conductive film for connecting electronic components, which are different in application. Accordingly, there is no suggestion of the desirability of the proposed combination, or an apparent reason why a person of ordinary skill in the art would combine Takada and Kobayashi.

In the '749 Office Action, it is asserted that there is motivation to combine these references and that Kobayashi attributes particular advantages to a polyvinyl butyral resin having certain specifications that helps the structure to adhere in a wide temperature range and improves the stability of the structure. The English Abstract of Kobayashi discusses these advantages in the entire context of the problem to be solved, which includes using the “polyvinyl butyral resin and three other specified components as the essential constituents.” (Emphasis added). Therefore, Kobayashi does not attribute the disclosed advantages solely to the polyvinyl butyral resin specifications, and thus, Kobayashi fails make up for the lacking suggestion or motivation to combine this reference with Nakano or Takada.

Therefore, claims 2-4 are allowable on their respective merits in addition to being allowable for being dependent from claim 1.

New Claims 5-7

New claims 5-7 are supported by the specification as filed at least at page 6, paragraph [0020], page 11, paragraph [0027] and page 17, paragraphs [0051] and [0052].

Claim 5, recites:

A spacer layer ... comprising: a butyral system resin as a binder; and at least one solvent selected from a group consisting of dihydroterpinyl oxyethanol, terpinyl oxyethanol, d-dihydrocarveol, I-citronellol, I-perillyl alcohol and acetoxy-methoxyethoxy-cyclohexanol acetate as a solvent, the spacer layer being adapted to be disposed between a dielectric ceramic green sheet and an inner electrode layer of the multi-layered ceramic electronic component.

Claim 6 recites:

a spacer layer having a second pattern, complementary to at least a portion of the first pattern, and applied to the ceramic green sheet, the spacer layer including a dielectric paste having a butyral system resin as a binder, and at least one solvent selected from a group consisting of dihydroterpinyl oxyethanol, terpinyl oxyethanol, d-dihydrocarveol, I-citronellol, I-perillyl alcohol and acetoxy-methoxyethoxy-cyclohexanol acetate as a solvent.

As discussed further above with respect to claim 1, the cited references do not relate to a spacer layer, and do not teach, suggest or motivate a dielectric layer having a butyral system resin and one of the solvents disclosed in claim 1, which are the same as those recited in claims 5 and 6, respectively. Accordingly, claims 5 and 6, and claim 7, which is dependent from claim 6, are allowable. Claim 7 is also allowable on its own merits because the cited references are not related to a spacer layer and also do not teach application of a dielectric paste on a release layer to form the spacer layer.

It is therefore respectfully submitted that all of the claims remaining in the application are now allowable. Favorable consideration and a Notice of Allowance are earnestly solicited.

Application No. 10/582,995
Reply to Office Action dated September 11, 2008

The Director is authorized to charge any additional fees due by way of this Amendment, or credit any overpayment, to our Deposit Account No. 19-1090.

Respectfully submitted,
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